

What is claimed is:

1. A method for use in a stored program controlled system comprising a plurality of processing units and a signal generator for interconnecting processing units using wavelength division multiplexing over a free space beam line, said method including the steps of:
 - generating a message at one of said plurality of processing units for a destination processing unit comprising another one of said plurality of processing units;
 - modulating the message on a specific optical wavelength;
 - transmitting the modulated message over said free space beam line;
 - receiving said modulated message at a wavelength selective receiver;
 - selecting a particular wavelength at said receiver; and
 - recreating the message and forwarding it to said destination processing unit.
2. A method in accordance with claim 1 wherein said signal generator includes a tunable laser, said step of modulating comprising:
 - tuning said tunable laser to said specific optical wavelength prior to modulating the message on said specific optical wavelength.
3. A method in accordance with claim 1 wherein said signal generator includes a plurality of fixed wavelength lasers, each of which operates on a different wavelength, said step of modulating comprising:
 - delivering said message to one of said plurality of fixed wavelength lasers corresponding to said specific optical wavelength prior to modulating the message on said specific optical wavelength.
4. A method in accordance with claim 1 wherein said wavelength selective receiver comprises tunable photodetectors, said step of selecting comprising:
 - tuning said tunable photodetector to said specific optical wavelength.
5. A method in accordance with claim 1 wherein said wavelength selective receiver comprises one of a plurality of fixed wavelength photodetectors, all operating at different wavelengths, said step of selecting comprising:
 - receiving only the fixed wavelength.

6. A method in accordance with claim 1 wherein said wavelength selective receiver comprises one of a plurality of fixed wavelength photodetectors and a tunable photodetector, said method further including the step of:

5 dynamically allocating bandwidth by receiving messages on a primary wavelength at said one of a plurality of fixed wavelength photodetectors and receiving one or more messages on other wavelengths at said tunable photodetector.

7. A method in accordance with claim 1 wherein each of said processing units includes a fixed transmitter comprising a laser configured to modulate on a fixed optical wavelength over said free space optical beam line and a tunable transmitter
10 comprising a tunable laser configured to modulate on multiple, selectable wavelengths, said method further including the step of:

dynamically allocating bandwidth by transmitting messages on a primary wavelength at said fixed wavelength transmitter and transmitting one or more messages on other wavelengths at said tunable transmitter.

8. A system for use in a stored program controlled system comprising a plurality of processing units for interconnecting said processing units using wavelength division multiplexing over a free space optical beam line, said system
15 comprising:

a transmitter configured to generate a message at one of said plurality of
20 processing units for a destination processing unit comprising another one of said plurality of processing units;

a laser configured to modulate the message on a specific optical wavelength over said free space optical beam line;

a wavelength selective receiver; and
25 means at said receiver for recreating the message and forwarding it to said destination processing unit.

9. A system in accordance with claim 8 wherein said laser comprises a tunable laser configured to modulate at a specific optical wavelength before transmitting said message.

30 10. A system in accordance with claim 8 wherein said laser comprises a fixed wavelength laser.

11. A system in accordance with claim 8 wherein said wavelength selective receiver comprises a tunable photodetector.

12. A system in accordance with claim 8 wherein said wavelength selective receiver comprises a fixed wavelength photodetector.

5 13. A system in accordance with claim 8 wherein said wavelength selective receiver comprises a fixed wavelength photodetector and a tunable photodetector configured to dynamically allocating bandwidth by receiving messages on a primary wavelength at said one of a plurality of fixed wavelength photodetectors and receiving one or more messages on other wavelengths at said tunable photodetector.

10 14. A system in accordance with claim 8 further including means for dynamic wavelength allocation and deallocation responsive to system load.